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Seismicity in the Ligurian Sea: Indications for Reverse Faulting

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Abstract

The convergence between the Africa and Eurasia plates dominates the tectonic setting in the western and central Mediterranean Sea leading to a complex structure consisting of basins and ranges. The Ligurian Sea as a part of the Western Mediterranean Sea is a basin generated by the southeast trench retreat of the Apennines-Calabrian Subduction Zone and back-arc extension. It is located next to the Alpine orogen and the Apennine system.

As the offshore part of the AlpArray initiative a network of 29 broad-band ocean bottom seismometers were installed from June 2017 to February 2018 in the Ligurian Sea as part of the German SPP2017-4D-MB and a contribution of the French IPGP. The local seismicity in the Ligurian Sea was investigated with the offshore stations and some onshore stations close to the coast in France and Italy.

Over 100 local earthquakes were located in the area of the network. The main area of seismic activity north of the network close to the Alpine orogen. A cluster of 14 earthquakes lies 150 km west of Corsica at (42.2°N / 7.1°E). The cluster was mainly active in June 2017 and in August 2017. The radiation pattern of the events indicates a reverse faulting mechanism, which is consistent with the moment tensor solution of two events close by from July 2011 and June 2012.